

**CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

1-21 (Cancelled)

22. (Currently Amended) Polythiophenes in accordance with **claim [[21]] 40** wherein R is alkyl containing from about 1 to about 20 carbon atoms; or wherein R is alkyl containing from about 6 to about 12 carbon atoms.

23. (Currently Amended) Polythiophenes in accordance with **claim [[21]] 40** wherein R is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, or dodecyl.

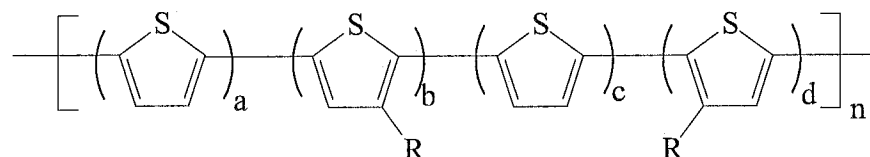
24. (Currently Amended) Polythiophenes in accordance with **claim [[21]] 40** wherein b and d are from about 1 to about 5.

25. (Currently Amended) Polythiophenes in accordance with **claim [[21]] 40** wherein b and d are from about 1 to about 3.

26. (Currently Amended) Polythiophenes in accordance with **claim [[21]] 40** wherein a is from about 0 to about 5, and c is about 1 to about 5, or wherein a is about 0 to about 3, and c is about 1 to about 3.

27. (Cancelled)

28. (Original) A process for the preparation of polythiophenes comprising reacting about 1 molar equivalent of a suitable monomer in an organic solvent with about 1 to about 5 molar equivalents of a ferric chloride at a temperature of from about 25°C to about 80°C, and which polythiophenes are of the formula



wherein a, b, c, and d represent the number of segments; each R is a side chain, and n represents the degree of polymerization or the number of repeating segments.

29. (Cancelled)

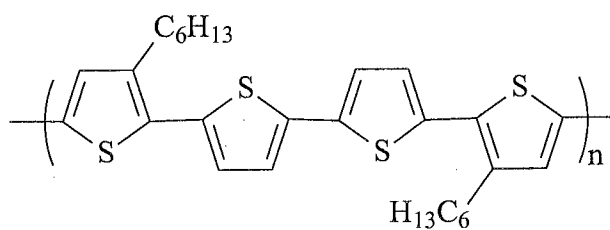
30. (Original) A process in accordance with **claim 28** wherein said R side chain is alkyl, substituted alkyl, or perhaloalkyl.

31. (Currently Amended) A process in accordance with **claim [[28]] 30** wherein alkyl contains from 1 to about 25 carbon atoms or from 4 to about 15 carbon atoms; wherein substituted alkyl is alkoxy alkyl, or siloxy substituted alkyl; and said perhaloalkyl is a perfluoroalkyl ~~perfluoro is a polyether.~~

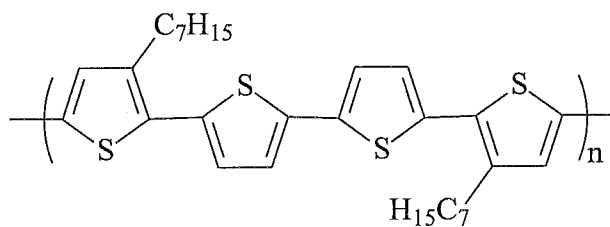
32. (Cancelled)

33. (Cancelled)

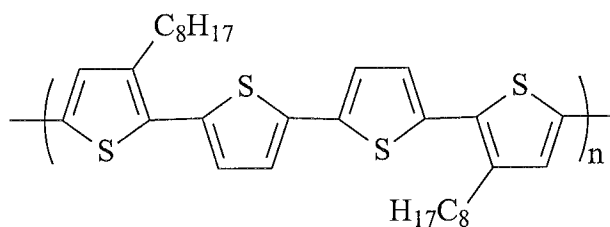
34. (New) Polythiophenes selected from the group consisting of polythiophenes (II-a) through (II-n)



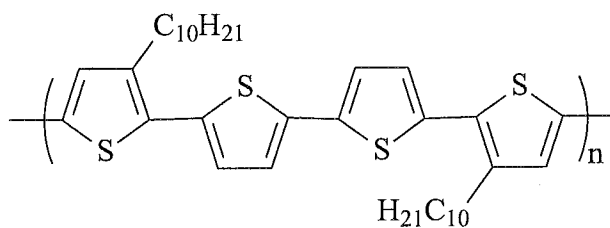
(II-a)



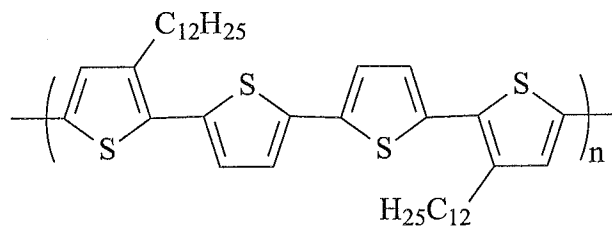
(II-b)



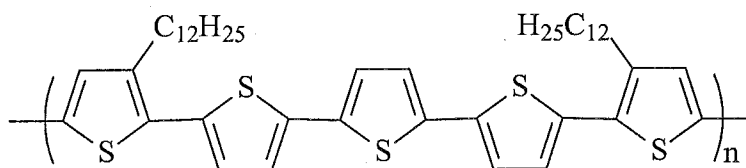
(II-c)



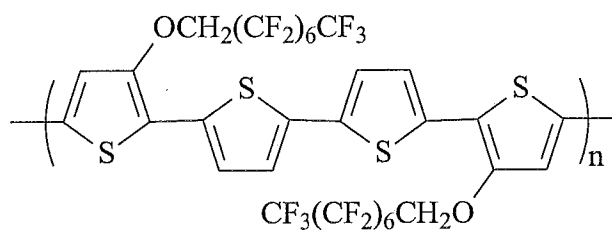
(II-d)



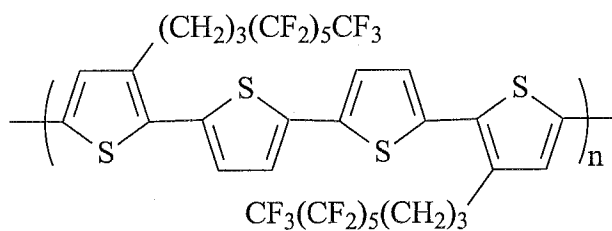
(II-e)



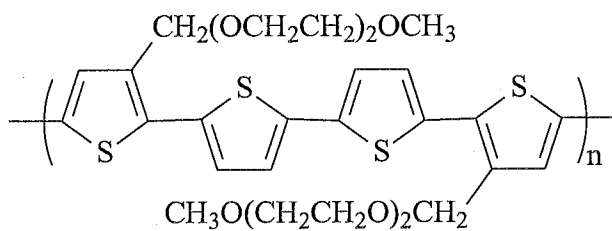
(II-f)



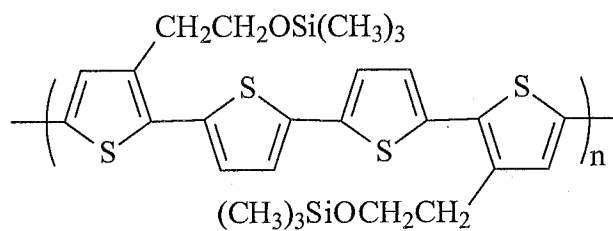
(II-g)



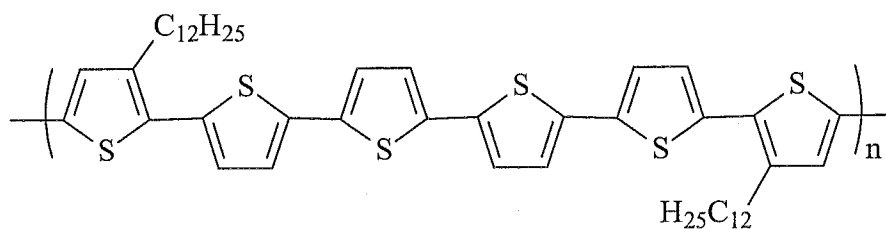
(II-h)



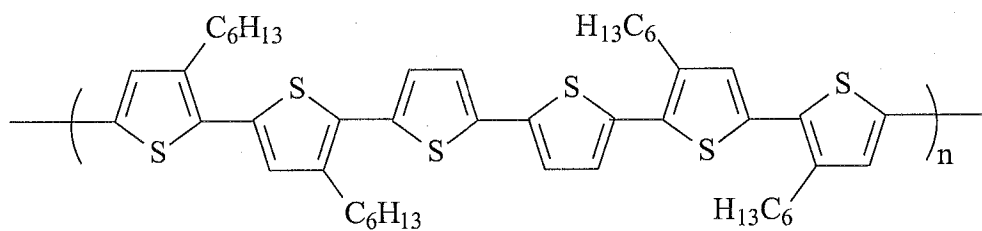
(II-i)



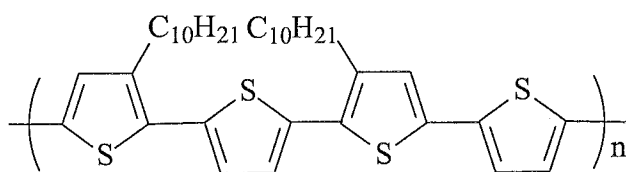
(II-j)



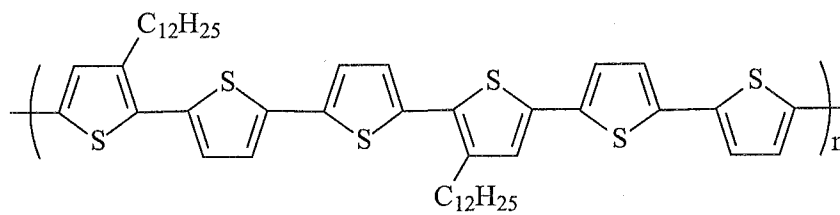
(II-k)



(II-l)



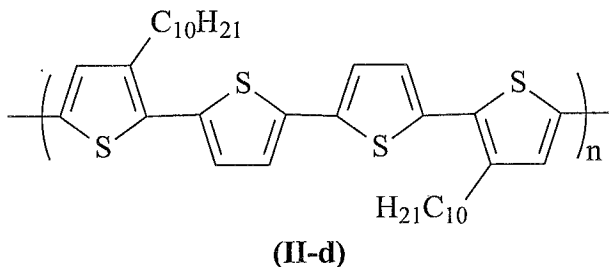
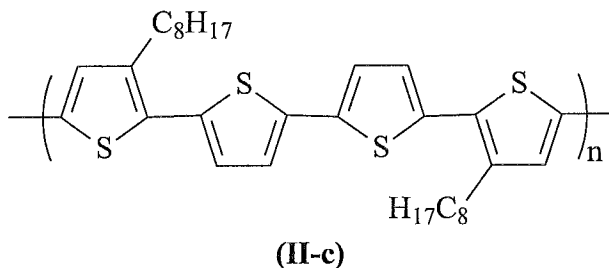
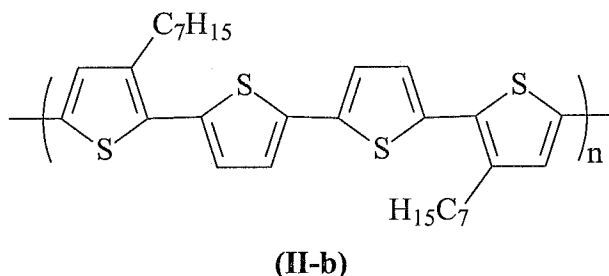
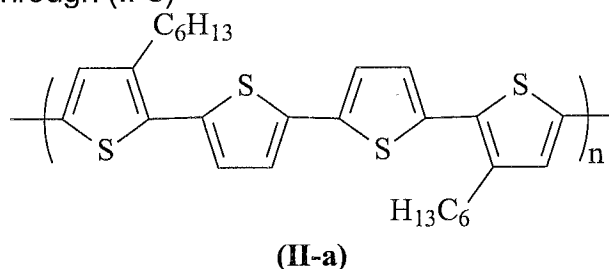
(II-m)

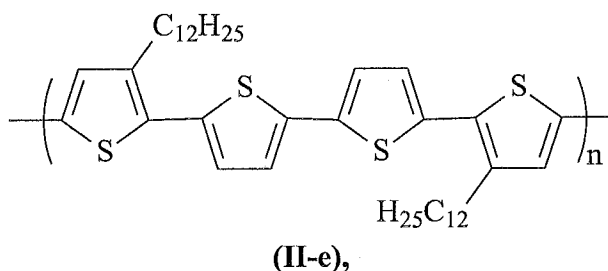


(II-n),

wherein n represents the degree of polymerization of from about 5 to about 5,000, and the polythiophene exhibits a number average molecular weight ( $M_n$ ) of from about 2,000 to about 100,000, a weight average molecular weight ( $M_w$ ) of from about 4,000 to about 500,000,  $M_n$  and  $M_w$  being measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

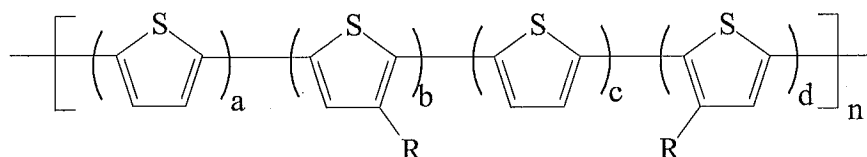
35. (New) Polythiophenes selected from the group consisting of polythiophenes (II-a) through (II-e)





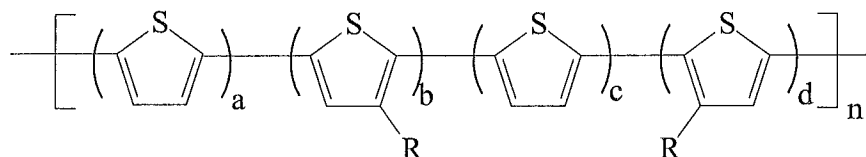
wherein  $n$  represents the degree of polymerization of from about 5 to about 5,000, and the polythiophene exhibits a number average molecular weight ( $M_n$ ) of from about 2,000 to about 100,000, a weight average molecular weight ( $M_w$ ) of from about 4,000 to about 500,000,  $M_n$  and  $M_w$  being measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

36. (New) Polythiophenes of the formula



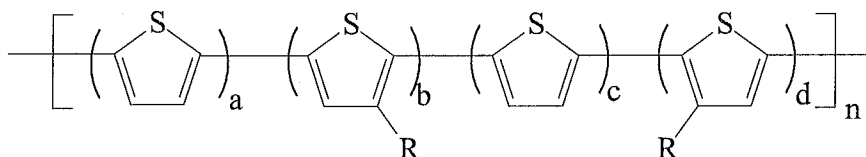
wherein  $R$  is alkoxyalkyl, siloxy substituted alkyl, a perhaloalkyl, or a polyether;  $a$  is an integer of from about 0 to about 5;  $b$ ,  $c$ , and  $d$  are integers of from about 1 to about 5; and  $n$  represents the degree of polymerization of from about 5 to about 5,000; the number average molecular weight ( $M_n$ ) of the polythiophenes is from about 2,000 to about 100,000, and the weight average molecular weight ( $M_w$ ) is from about 4,000 to about 500,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

## 37. (New) Polythiophenes of the formula



wherein R is alkyl containing from 1 to about 20 carbon atoms; a is an integer of from about 0 to about 5; b, c, and d are integers of from about 1 to about 5; and n represents the degree of polymerization of from about 10 to about 1,000; the number average molecular weight ( $M_n$ ) of the polythiophenes is from about 4,000 to about 50,000, and the weight average molecular weight ( $M_w$ ) is from about 5,000 to about 100,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

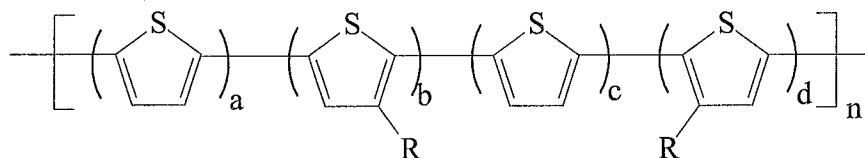
## 38. (New) Polythiophenes of the formula



wherein R is a perfluoroalkyl of about 2 to about 15 carbon atoms; a is an integer of from about 0 to about 5; b, c, and d are integers of from about 1 to about 5; and n represents the degree of polymerization of from about 5 to about 5,000; the number average molecular weight ( $M_n$ ) of the polythiophenes is from about 2,000 to about 100,000, and the weight average molecular weight ( $M_w$ ) is from about 4,000 to about 500,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

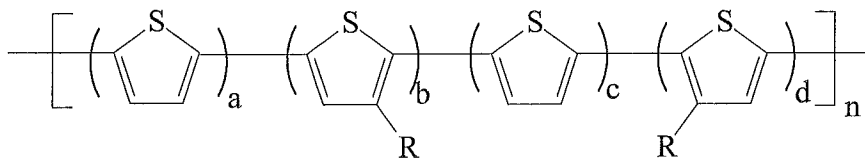


39. (New) Polythiophenes of the formula



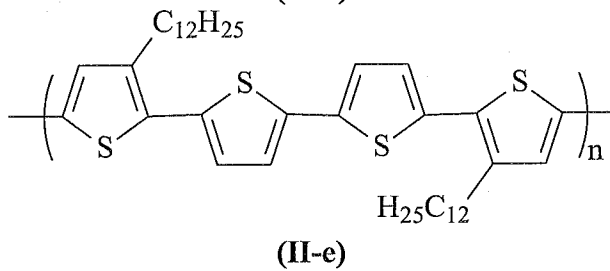
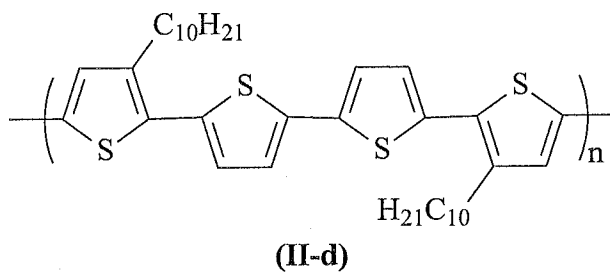
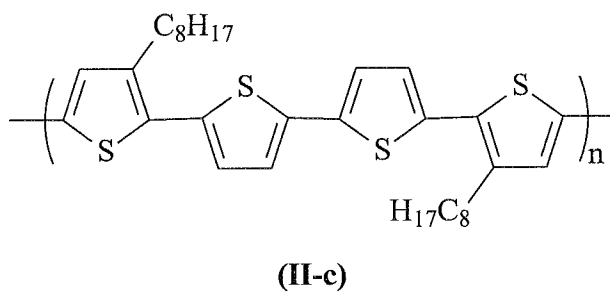
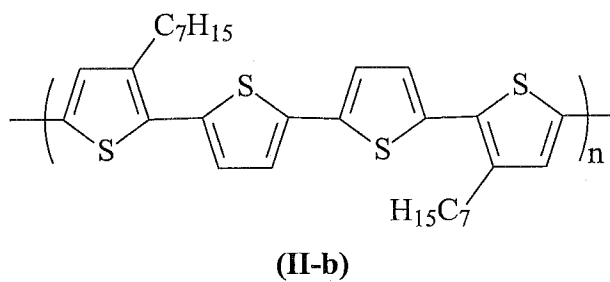
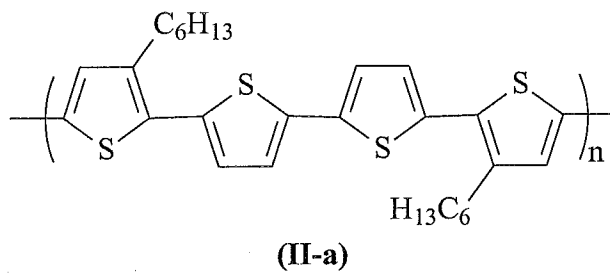
wherein R is a siloxyalkyl or trimethylsiloxyalkyl or trichthylsiloxyalkyl, the alkyl optionally containing from about 4 to about 10 carbon atoms, and which alkyl is butyl, pentyl, hexyl, heptyl, or octyl; a is an integer of from about 0 to about 5; b, c, and d are integers of from about 1 to about 5; and n represents the degree of polymerization of from about 5 to about 5,000; the number average molecular weight ( $M_n$ ) of the polythiophenes is from about 2,000 to about 100,000, and the weight average molecular weight ( $M_w$ ) is from about 4,000 to about 500,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

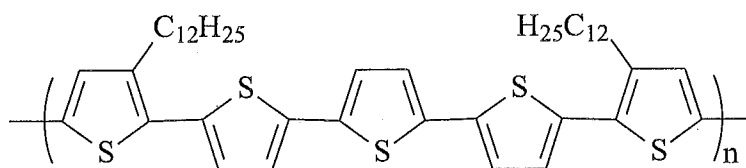
40. (New) Polythiophenes of the formula



wherein R is a side chain; a is an integer of from about 0 to about 5; b, c, and d are integers of from about 1 to about 5; and n represents the degree of polymerization of from about 10 to about 1,000; the number average molecular weight ( $M_n$ ) of the polythiophenes is from about 2,000 to about 100,000, and the weight average molecular weight ( $M_w$ ) is from about 4,000 to about 500,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.

41. (New) Polythiophenes selected from the group consisting of polythiophenes (II-a) through (II-f)





(II-f),

wherein n represents the degree of polymerization of from about 100 to about 4,000, and the polythiophene exhibits a number average molecular weight ( $M_n$ ) of from about 2,000 to about 100,000, a weight average molecular weight ( $M_w$ ) of from about 4,000 to about 500,000,  $M_n$  and  $M_w$  being measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about  $10^{-6}$  to about  $10^{-9}$  S/cm.